

What is claimed is:

1. A control system for a hybrid vehicle with a combustion engine for outputting a driving force, an electric motor for generating a force for assisting the output from the engine, depending on driving conditions, a power storage unit for storing electric energy generated by the motor acting as a generator using the output from the engine and electric energy regenerated by the motor when the vehicle decelerates, the control system comprising:

an output assist determination device for determining, based on a determination threshold value as the standard, whether to assist the output from the engine by the motor, depending on the driving conditions of the vehicle;

an air-fuel controller for changing the air-fuel ratio of the mixture, which is to be supplied to the engine, to a condition leaner or richer than the stoichiometric air-fuel ratio; and

a determination threshold value changer for changing the determination threshold value, depending on whether the air-fuel ratio of the mixture is leaner or richer than the stoichiometric air-fuel ratio.

2. A control system for a hybrid vehicle according to claim 1, further comprising a determination threshold value change prohibiting device for prohibiting the operation of the determination threshold value changer when the air-fuel controller changes the air-fuel ratio of the mixture from the condition leaner than the stoichiometric air-fuel ratio to the condition richer than the stoichiometric air-fuel ratio.

3. A control system for a hybrid vehicle according to claim 2, further comprising a

terminating device for terminating the prohibition of the change of the determination threshold value while the determination threshold value change prohibiting device prohibits the change of the determination threshold value, when the air-fuel ratio controller detects that the air-fuel ratio of the mixture is leaner than the stoichiometric air-fuel ratio, or when the prohibition of the change of the determination threshold value has been maintained for a specified time.

4. A control system for a hybrid vehicle with a combustion engine for outputting a driving force, an electric motor for generating a force for assisting the output from the engine, depending on driving conditions, a power storage unit for storing electric energy generated by the motor acting as a generator using the output from the engine and electric energy regenerated by the motor when the vehicle decelerates, the control system comprising:

an output assist determination device for determining, based on a determination threshold value as the standard, whether to assist the output from the engine by the motor, depending on the driving condition of the vehicle;

an air-fuel controller for changing the air-fuel ratio of the mixture, which is to be supplied to the engine, to a condition leaner or richer than the stoichiometric air-fuel ratio;

a determination threshold value changer for changing the determination threshold value, depending on whether the air-fuel ratio of the mixture is leaner or richer than the stoichiometric air-fuel ratio;

an exhaust cleaner having an oxygen concentration measurement device, provided in an exhaust system of the engine, for measuring oxygen concentration in exhaust gas, and a nitrogen oxide reduction device for absorbing nitrogen oxide in the

exhaust gas when the oxygen concentration in the exhaust gas is high and for reducing the absorbed nitrogen oxide when the oxygen concentration in the exhaust gas is low;

a reduction device for setting the air-fuel ratio of the mixture to the condition richer than the stoichiometric air-fuel ratio so as to reduce the oxygen concentration in the exhaust gas, when the air-fuel ratio of the mixture, which is to be supplied to the engine, is leaner than the stoichiometric air-fuel ratio; and

a determination threshold value change prohibiting device for prohibiting the operation of the determination threshold value changer when the reduction device changes the air-fuel ratio of the mixture from the condition leaner than the stoichiometric air-fuel ratio to the condition richer than the stoichiometric air-fuel ratio.

5. A control system for a hybrid vehicle according to claim 4, further comprising:  
a vehicle speed measuring device for detecting the speed of the vehicle,  
wherein

the reduction device sets the air-fuel ratio of the mixture to the condition richer than the stoichiometric air-fuel ratio so as to reduce the oxygen concentration in the exhaust gas at a time interval depending on the vehicle speed detected by the vehicle speed measuring device.

6. A control system for a hybrid vehicle according to claim 4, further comprising a terminating device for terminating the prohibition of the change of the determination threshold value while the determination threshold value change prohibiting device is prohibiting the change of the determination threshold value, when the air-fuel ratio controller detects that the air-fuel ratio of the mixture is leaner than the stoichiometric air-fuel ratio, or when the prohibition of the change of the determination threshold value

is maintained for a specified time.

7. A control system for a hybrid vehicle according to claim 5, further comprising a terminating device for terminating the prohibition of the change of the determination threshold value while the determination threshold value change prohibiting device prohibits the change of the determination threshold value, when the air-fuel ratio controller detects that the air-fuel ratio of the mixture is leaner than the stoichiometric air-fuel ratio, or when the prohibition of the change of the determination threshold value has been maintained for a specified time.

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